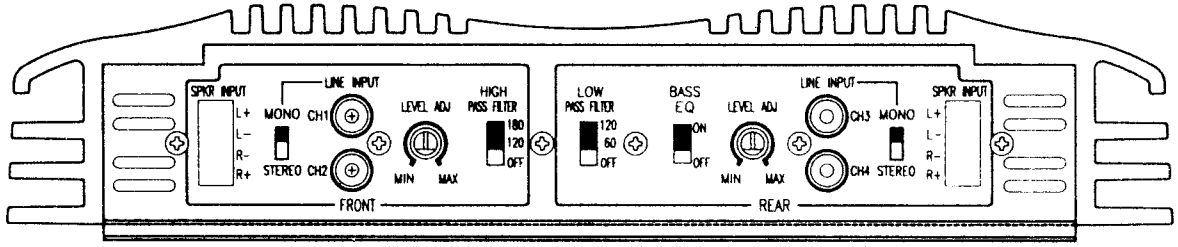
Sherwood

OPERATION MANUAL

XA-5300/
XA-5400

BRIDGEABLE 4 CHANNEL AMPLIFIER



Congratulations on your Purchase !

Your new high fidelity bridgeable/stereo amplifier is designed to deliver maximum enjoyment and years of trouble free service. Please take a few moments to read this manual thoroughly. It will explain the features and operation of your unit and help insure trouble free installation.

Features

- Tri-power
- Bridgeable/mono
- Four channels
- Two ohm stable per channel
- Gold plated screw terminals
- Bass EQ + 6dB gain at 45 hertz on channels 3 and 4
- Low/line level input
- Speaker/high level input
- Gold plated RCA jacks
- Independent front and rear level controls
- Electronic high pass crossover
- Electronic low pass crossover
- Mos-fet power supply
- Anti-thump circuit
- Power LED
- Peak LED
- Plug in fuse
- Pre-out+
- Built-in cooling fan (on XA-5400 only)

Precautions: Read First !

- If after reading the directions you feel uncomfortable about installing the amplifier in your car, or not equipped or competent to do so, you should have the amplifier installed by an authorized Sherwood Dealer/Installer. It's your car !

- Negative battery terminal must be disconnected before any electrical connections are made.

- Be sure to choose a location that provides substantial ventilation for the amplifier. The most preferred locations would be in your car's trunk, under the front seats or on the back wall of a truck.

- The location chosen should provide at least 2" of clearance above the amplifier for adequate ventilation.

- If the amplifier is to be mounted vertically, be sure that it is in a place where adequate air will flow along the length of its heatsink fins for cooling.

- NEVER mount the amplifier up side down, this will cause the heat to rise back into the amplifier causing thermal shutdown or possible permanent damage.

- NEVER mount the amplifier in a location that is subject to direct sunlight or exposed to moisture.

- Be sure to mount the amplifier to a strong, solid surface which will not give way under the stress of a sudden stop or accident.

- Make sure that the mounting screws will not penetrate the gas tank, brake and fuel lines, wiring or other critical parts of your car when installed.

- NEVER operate the amplifier without the proper power and ground wire. (10 gauge minimum for model XA-5300 AND XA-5400)

- NEVER operate the amplifier without proper fusing. Fuse holder must be located within 18 ′ from the battery. This fuse is to protect the car not the electronics. In case of a short, the fuse will blow instead of the wire burning up. Using other than the recommended fuse ratings at the battery and at the amplifier may cause damage to the amplifier and will void your warranty.

- Do not run wiring underneath or outside the car since such exposure to the elements may cause the insulation to deteriorate rapidly, resulting in short-circuits and/or intermittent operation. All cables should be run beneath carpets and inside trim pieces.

- To help minimize interference, it is best to run the power cables along the opposite side from the audio cables.

- Wherever wires pass through metal, rubber or plastic grommets must be used to prevent the metal from wearing through the insulation and causing a short.

- Whenever possible, use cable ties, mounting clamps and similar wiring aids (available from an electrical supply or auto parts store). Adding stress relief loops to the wiring is also advisable to prevent straining or breakage.

- *It is best to test the system before the amplifier is* mounted and interior of car is reassembled.

- If the temperature inside your car reaches extreme levels (such as sitting locked up for several hours in the hot sun or exposed to a very cold winter's day) the amplifier may go into protection mode and shut off. Leave the unit off until the ambient temperature returns to normal.

- The XA-5300/XA-5400 operates with any vehicle using a 12-volt negative ground system. If you are not sure of the type of electrical system in your vehicle, consult your authorized Sherwood dealer or qualified mechanic.

- NEVER ground the speaker leads and NEVER allow the speaker leads to come in contact with each other. Speaker wire should be 18 gauge or larger.

- Remote turn on wire must be switched by the radio. If the radio does not have a remote turn on or antenna output, connect to wire that has a positive 12-volts when the key is turned to the accessory position. If the amplifier does not turn off the battery will die.

- Do not listen to high volumes for extended periods of time or hearing damage may occur.

Installation

MOUNTING:

1. After reading precautions decide where you are going to install the unit. Also, see Fig. 1 and Fig. 2.
2. Once the location has been determined, place the amplifier in position. Using a felt tip pen or pencil mark the six holes to be drilled for mounting. NEVER use the amplifier as a template for drilling. It is very easy to damage the amplifier surface in this manner.
3. Remove amplifier. Drill six 3.6 m.m.(9/64 inch) diameter holes into mounting surface.
4. If possible test the system operation before final mounting of the amplifier.
5. Mount the amplifier using the supplied 6 self threading screws.

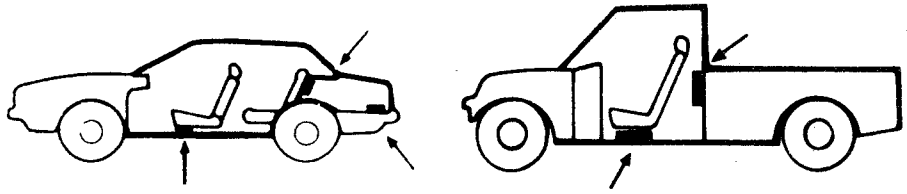


Fig. 1 Mounting Position

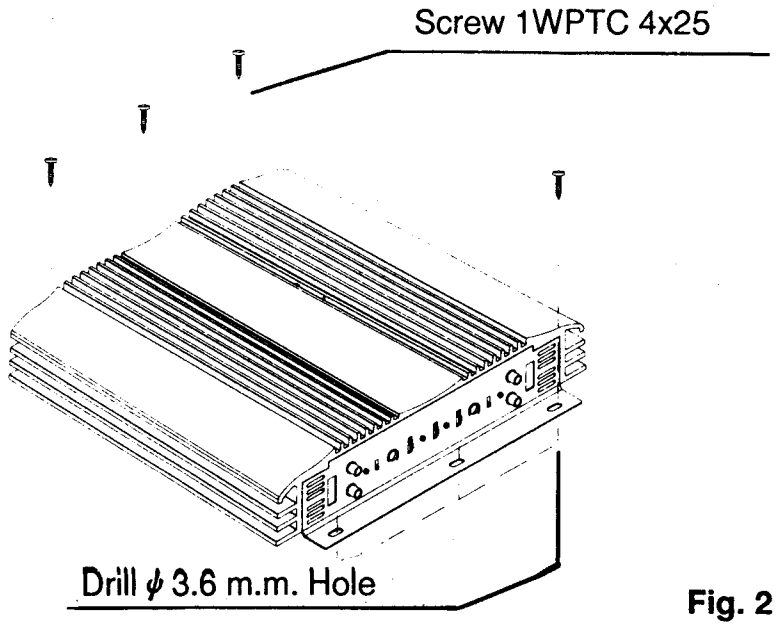


Fig. 2 On-Chassis Mounting

Input Connections

This amplifier will accept either high or low level inputs. High level is the same as speaker level. Low level is the same as line level or preamp level. Low level signal is carried through RCA cables. It is preferred to use low level inputs to the amplifier if the head unit is equipped with low level outputs. NEVER use both high and low inputs at the same time.

1. Hig level/speaker input-Connect wires from the supplied four wire high level connector to the corresponding speaker outputs of the head unit receiver. High Level Input Connnections.

2. Low level/line input-Connect RCA cables from head unit, or other signal processor, to the line level input on the amplifier. See Fig. 4. Low level input Connections.

PRE-OUT +

This unique feature allows a multi amplifier system to be built using a head unit without pre-amp or line outputs (factory head unit). For example, this primary system consists of the car's factory head unit, a XA-5300 or XA-5400 connected through the speaker level input plugs, and the factory speakers. The pre-out + is convenient when an additional amplifier, such as the XA-5450, is added to power subwoofers. The line inputs that are not being used on the primary amplifier (speaker level input plug is used) will automatically become line input of the additional amplifier using standard RCA cables. Pre-out + allows this system to function without the use of multiple expensive " speaker to RCA" adapters See Fig.3-1.

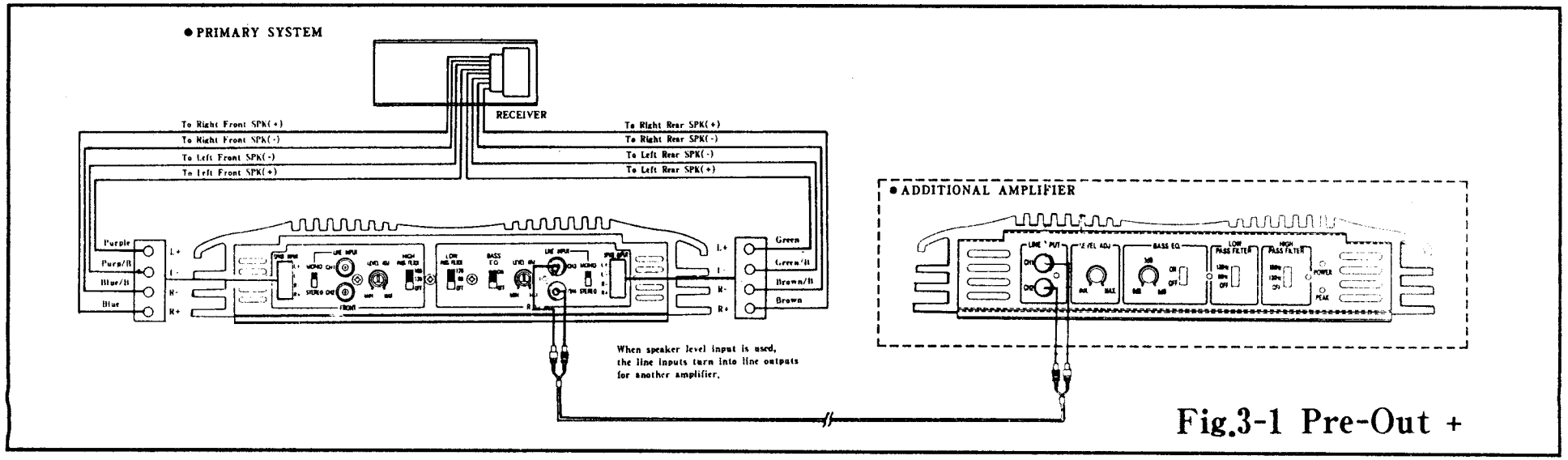
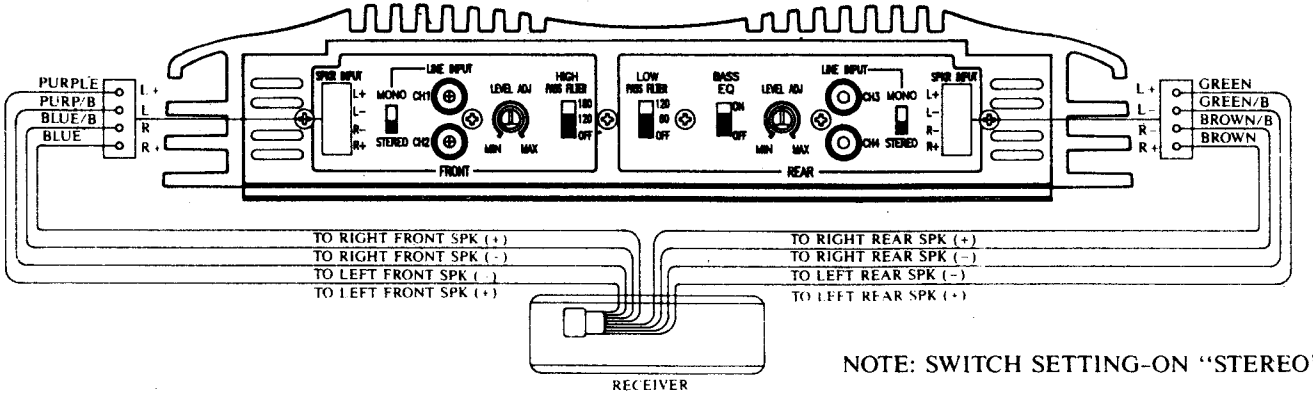


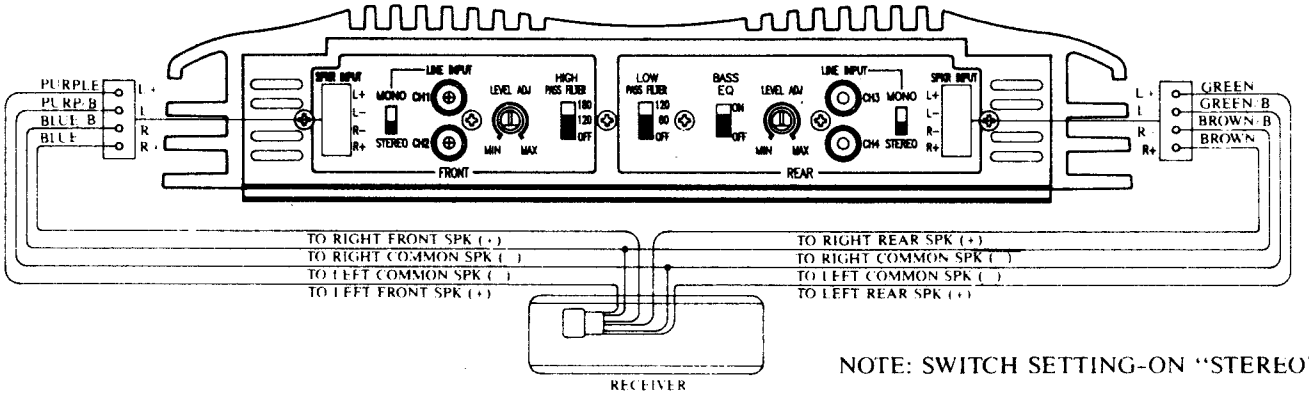
Fig.3-1 Pre-Out +

(1) CONNECTION FOR 8 SPK OUT WIRES FROM HEAD UNIT



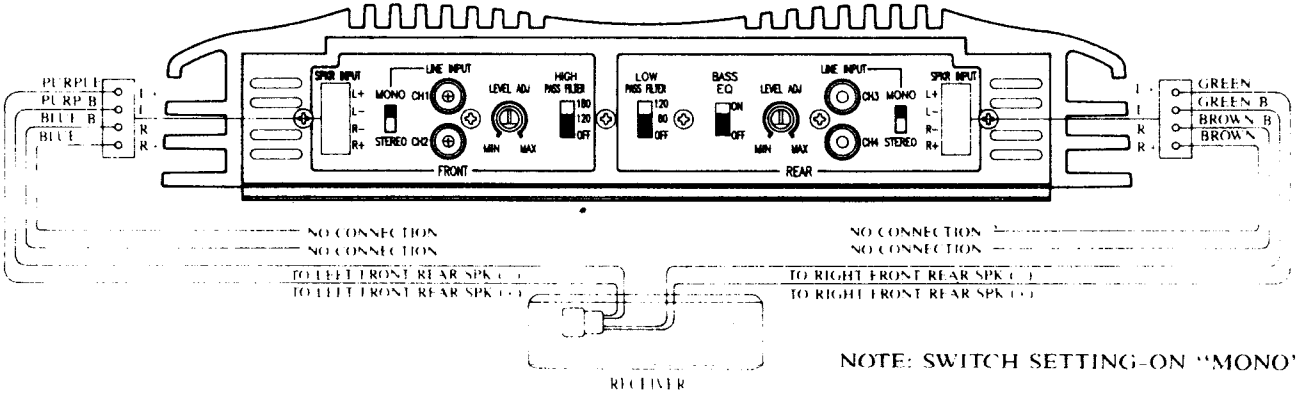
NOTE: SWITCH SETTING-ON "STEREO"

(2) CONNECTION FOR 6 SPK OUT WIRES FROM HEAD UNIT



NOTE: SWITCH SETTING-ON "STEREO"

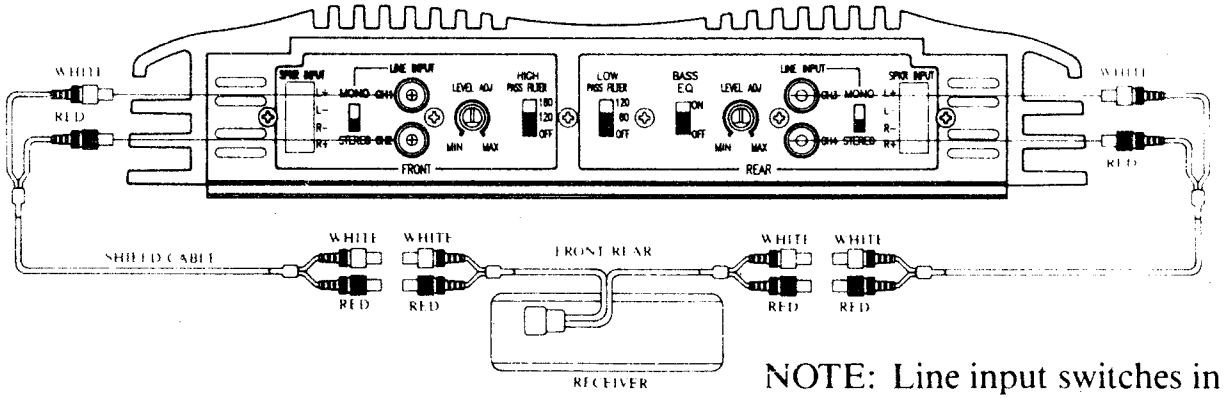
(3) CONNECTION FOR 4 SPK OUT WIRES FROM HEAD UNIT



NOTE: SWITCH SETTING-ON "MONO"

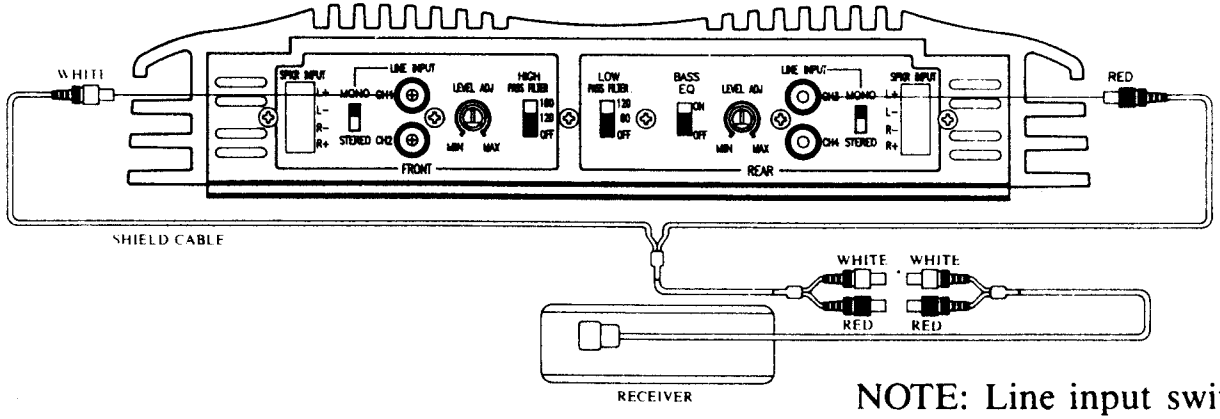
Fig. 3 High Level Input Connections

(1) CONNECTION FOR 4CH LINE OUT FROM HEAD UNIT



NOTE: Line input switches in "STEREO" position for stereo operation or "MONO" for Bridged (BTL) operation.

(2) CONNECTION FOR 2CH LINE OUT FROM HEAD UNIT



NOTE: Line input switches in "MONO" position.

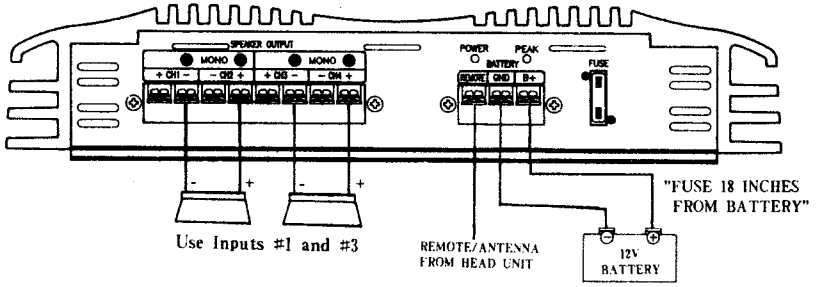
Fig. 4 Low Level Input Connections

Speaker Connections

This amplifier can operate in either two, three or four channels. The minimum impedance for each of the four channels of operation is 2 ohms per channel. The minimum impedance for bridged/mono operation of each pair of channel is 4 ohms.This amplifier is also capable of operating two channel stereo and mono at the same time from channels 1 and 2, or 3 and 4, or both pairs. We call this Tri-Power. Minimum impedances remain the same for three channel (satellite/subwoofer) systems as long as proper passive crossovers are used.

Connect right and left speaker wires to corresponding speaker output terminals of the amplifier. Be sure to have the positive wire from the speaker to the positive speaker terminal of the amplifier and the negative wire from the speaker must connect with the negative speaker terminal of the amplifier. Reversing any of these connections will result in the speaker cones moving out of phase which causes bass cancellation. See Fig. 5. Speaker Output Connections.

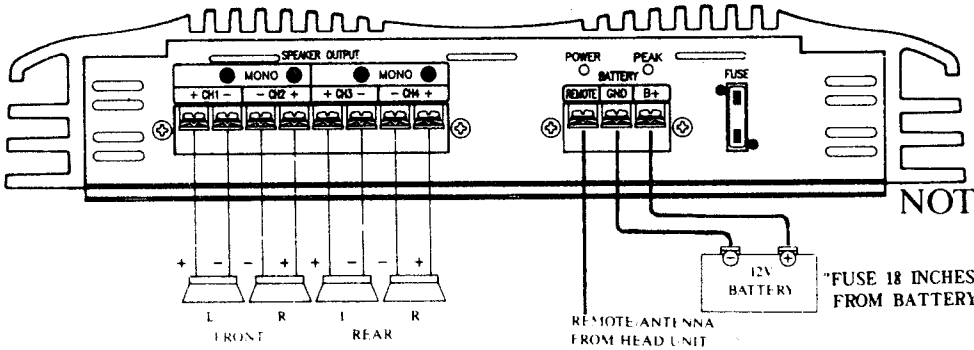
A. 2 CHANNEL STEREO MODE



NOTE: Switch settings
HIGH PASS FILTER-"OFF"
LOW PASS FILTER-"OFF"
BASS EQ-"OFF"
MONO/STEREO - BOTH "MONO"

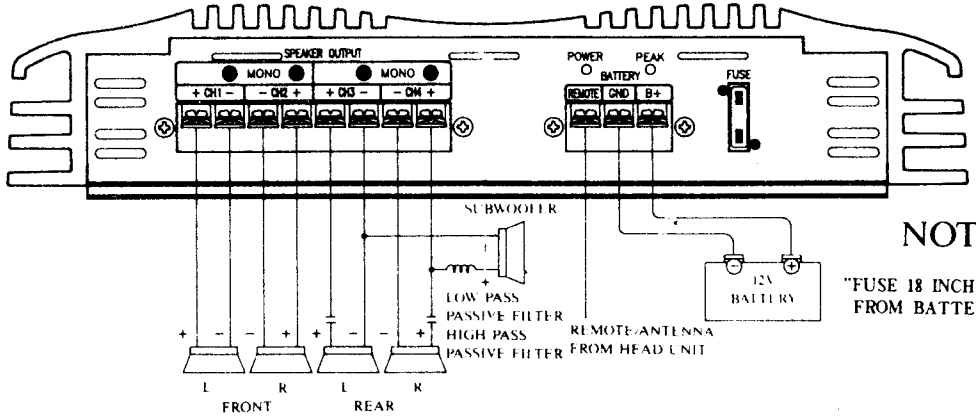
Fig.3-1 Speaker Output Connections

B. 4-CHANNEL STEREO MODE



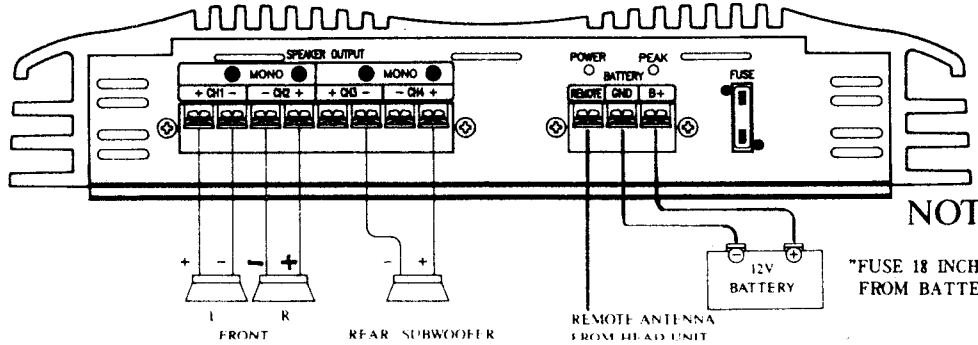
NOTE: Switch settings
HIGH PASS FILTER-"120, 180 or OFF"
LOW PASS FILTER-"OFF"
BASS EQ-"OFF"

C. 4-CHANNEL STEREO MODE WITH MONO SUB-WOOFER MODE



NOTE: Switch settings
HIGH PASS FILTER-"120 or 180"
LOW PASS FILTER-"OFF"
BASS EQ-"ON or OFF"

D. STEREO SPEAKERS WITH MONO SUB-WOOFER MODE



NOTE: Switch settings
HIGH PASS FILTER-"120 or 180"
LOW PASS FILTER-"120 or 60"
BASS EQ-"ON or OFF"

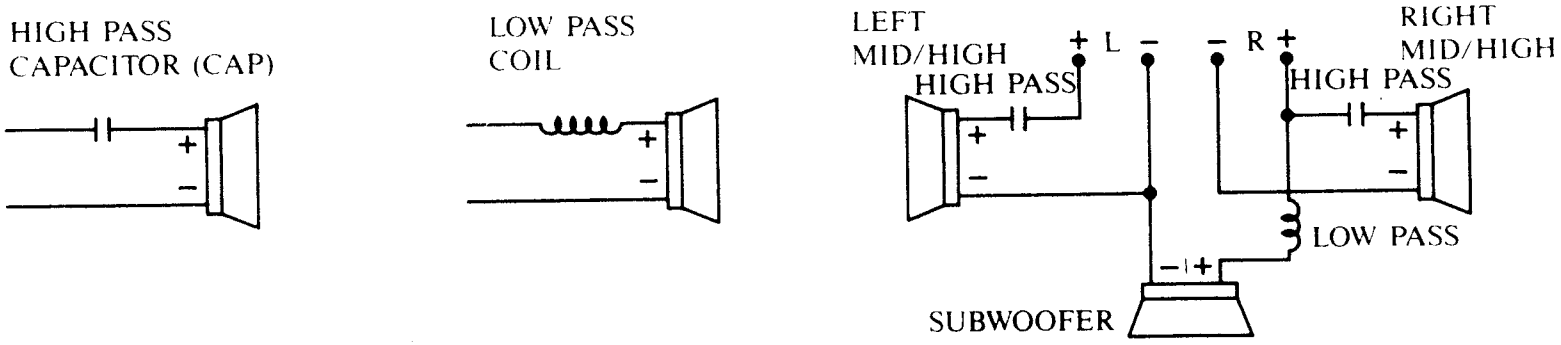
Fig. 5 Speaker Output Connections

Tri-Power Speaker Connections

With the extreme flexibility of the Sherwood XA-5300/XA-5400, we highly recommend that you carefully design the entire system BEFORE its installation. The amplifier's "TRI-POWER" feature allows the amplifier to power a pair of satellites or coaxials and add on a single subwoofer. This means the amplifier is operating in stereo and mono at the same time. As previously mentioned earlier the minimum impedance for stereo is 2 ohms per channel and 4 ohms for mono. For this to all work together, passive crossovers must be utilized. These crossovers are a combination of coils and capacitors to creat a high pass for the mid/tweeter combination and a low pass for the subwoofer. A high pass crossover eliminates all frequencies below the crossover frequency (cutting the bass out of the highs). A low pass crossover eliminates all frequencies above the crossover frequency (cutting the highs out of the bass). The following crossover chart (6 dB per octave) is for your reference. In this application the low pass and high pass switch on the amplifier must be in the "OFF" position. The coils and capacitors are available through most electronic stores and most car audio dealers. See Fig. 6 for chart and diagram.

Fig. 6. Tri-Power Connections

CROSSOVER FREQUENCY IN HERTZ	SPEAKER IMPEDANCE					
	2 OHM		4 OHM		8 OHM	
	COIL	CAPACITOR	COIL	CAPACITOR	COIL	CAPACITOR
80	4.1 mH	1000 μF	8.2 mH	500 μF	16 mH	250 μF
100	3.1 mH	800 μF	6.2 mH	400 μF	12 mH	200 μF
130	2.4 mH	600 μF	4.7 mH	300 μF	10 mH	150 μF
200	1.6 mH	400 μF	3.3 mH	200 μF	6.8 mH	100 μF
260	1.2 mH	300 μF	2.4 mH	150 μF	4.7 mH	75 μF
400	0 .8 mH	200 μF	1.6 mH	100 μF	3.3 mH	50 μF
600	0 .5 mH	136 μF	1.0 mH	68 μF	2.0 mH	33 μF
800	0.41 mH	100 μF	0.82 mH	50 μF	1.6 mH	25 μF
1000	0.31 mH	78 μF	0.62 mH	38 μF	1.2 mH	20 μF
1200	0.25 mH	66 μF	0.51 mH	38 μF	1.0 mH	16 μF
1300	0.16 mH	44 μF	0.33 mH	22 μF	0.68 mH	10 μF
4000	0.08 mH	20 μF	0.16 mH	10 μF	0.33 mH	5 μF
6000	0.51 mH	14 μF	0.10 mH	6.8 μF	0.29 mH	3.3 μF



Power Connections

It is important to have good quality power and ground connections. Remember, to complete an electrical circuit, the ground connection is just as important as the positive power connection. Before any power connections are made, disconnect the ground cable at the battery. Minimum battery cable size for XA-5300 and XA-5400 is gauge.

Ground-Connect the proper gauge ground wire to the amplifier "GND" terminal. Locate the position on the chassis of the car to which the amplifier is to be grounded. The surface must be free from any paint or dirt. This can be accomplished with a small grinding bit or wire wheel.

NOTE: Do not ground amplifier to the "frame" of the car, the frame on most cars and trucks is not grounded to the chassis (body). Solder or crimp ring terminal to ground wire. Predrill the prepped chassis metal to bolt the ground ring terminal with nut, bolt and lock washers. Insulate metal and connector with paint or silicon to prevent rust and oxidation. Silicon also works great to prevent nuts and bolts from working loose in a harsh environment of an automobile. Upon completion of ground connection, grab wire or connector and confirm that it is a solid connection. To prevent engine noise, it is recommended to ground the head unit and other audio electronics in the same location.

Remote Turn-on-Connect smaller light gauge wire to "REMOTE" terminal of amplifier and to remote/antenna turn-on output of head unit. If head unit is not equipped with a remote/antenna output, locate a wire that is controlled by the accessory position of the key. It is important to have the amplifier turn off with the radio or key. If the amplifier remains on, the result will most likely be a dead battery.

Positive-Connect the proper size wire to the amplifier "B+" terminal of amplifier. Run wire towards the fuse holder that is no greater than 18 inches from the battery. Remember, the fuse is to protect the safety of the car in the case of a short. Connect fuse holder to battery, however, do not install fuse at this time.

Adjustments

High pass filter-The "HIGH PASS FILTER" is a three position switch "180, 120, OFF". The high pass filter operates only with front channels 1 and 2. The electronic high pass filter cuts out the bass from the mids/highs and will pass all frequencies above 120 or 180 hertz. The final decision between "120" and "180" will be based on the final listening of the system and speaker's ability to play lower frequencies. If channels 1 and 2 are used to power full range speakers and subwoofers sre not used on rear channels 3 and 4 place the " HIGH PASS FILTER" to the "OFF" position.

Low pass filter-The "LOW PASS FILTER" is a three position switch "120, 60, OFF". The low pass filter operates only with rear channels 3 and 4. If the rear channels are 3 and 4 are only to be used to power subwoofers, the switch should be at either at the "60" or the "120" position. This will cut out all high frequencies above 60 or 120 hertz. The final decision between "60" and "120" will be based on the final listening of the system. If the amplifier is to power full range speakers place the "LOW PASS FILTER" to the "OFF" position.

After initial adjustments have been made, install fuse (same rating as that labeled on the amplifier) into the fuse holder at the battery.

Level adjustments- The sensitivity adjustments is to allow the amplifier to work with many different brands of head units. It allows input signal to vary between 250 millivolts to 2 volts from the head unit or other signal processor. Start by setting the sensitivity adjustments to the "MIN"(2 volts).

Disconnect the inputs for rear channels 3 and 4; follow adjustments for front channels 1 and 2. Using a cassette or compact disc that you are familar with, turn on head unit to the 3/4 volume setting. Slowly turn up sensitivity adjustment towards the "MAX"(250 milivolts) using a small flat head screw driver. Stop turning on the onset of distortion and turn back just a slight. The 3/4 volume setting is now the "maximum" volume for the head unit.

Now disconnect front inputs 1 and 2 connect rear channels 3 and 4 and adjust as above.

The goal is to keep the level control to the lowest setting yet still have enough signal to drive the amplifier. This is done to prevent over driving the amplifier and to keep system noise to a minimum. After front and rear channels have been adjusted independently, listen to front and rear channels at the same time. Adjust front and rear levels so that either the front or the rear does not over power the other. It is important not to over drive the speakers (at point of distortion) as this will cause permanent damage to the speakers. Also, if the amplifier itself is over driven, it could be damaged.

Bass EQ. The "BASS EQ" feature is a +6 dB boost at 45 hertz on rear channels 3 and 4. This may or may not be required for the system. Remember, a +6dB boost in signal requires the amplifier to work 10 times harder. Again, do not over drive the speakers or the amplifier.

NOTE: If you need more bass boost to obtain the desired bass output, something is wrong. Check either the subwoofer cabinet design or remember that small full range speakers can not produce the bass of large subwoofers.

Troubleshooting Guide

This section provides you with a catalog of amplifier symptoms and their probable causes and solutions. Before you consult this listing, make sure the vehicle's electrical system is working properly by verifying that other electical items(e.g. headlight, Windows etc.) still function correctly.

SYMPTOM	PROBABLE CAUSE	SOLUTION
No Sound	Low or No Remote Turn-On connections	Check remote turn-on voltage at amp and head unit
	Blown Fuse	Repalce with new fast-blow fuse
	Power wires not connected	Check butt splices or solder joints check Ground and Battery connections
	Blown speakers or not connceted	Use VOM or DVM to measure speaker coil impedance; check spaker wiring connections
Audio cycles on and off	Thermal Protection Circuits are properly shutting amplifier off each time it gets too hot	Check location for adequate ventialtion check speaker wiring for a short to chassis Check speaker impedance and refer to speaker conections
Distorted Audio	Input Sensitivity not set properly or damaged speaker cones	See adjustment procedure and check each step; inspect each speaker for damage and repair or suspected component
	Low turn-on voltage	Refer to head unit owner's manual
Audio level low	Mute circuits is on Head unit	Check electrical system for low voltage; check ground connection
Audio lacks	Speaker wired with wrong polarity, cause cancellation of bass frequencies	Check polarity of wires from amplifiers to each speaker as defined by the system design; check battery voltage at amplifier during operation
External fuse blowing	Incorrect wiring or short circuit	Refer to Electrical Installtion and check each installtion step
Whining noise on audio with engine running	Amplifier is picking up alternator noise	Install an in-line noise filter on the head unit's power wire; check alternator routing diodes or voltage regulator for proper operation. Check all grounds, check battery voltage
Ticking noise on audio with engine running	Amplifier is picking up radiated spark noise	Check RCA audio cables routes; Install an in-line noise filter on the head unit's power wire. Check spark plug wires

SPECIFICATIONS

■ Amplifier Sections	XA-5300	XA-5400
■ MAX POWER (EIAJ)		
● Mono Mode	2 x150Watt	2 x 200Watt
● Stereo Mode	4 x 75 Watt	4 x 100Watt
RMS Power(4 Ohms)		
● Mono Mode	2 x 100Watt	2 x150Watt
● Stereo Mode	4 x 40 Watt	4 x 65Watt
● THD	0.1%	0.1%
● Power Bandwidth	20Hz - 20,000Hz	20Hz - 20,000 Hz
● Frequency Response	5 Hz - 90.000Hz	5Hz- 90,000Hz
● Signal to Noise Ratio	102 dB	102 dB
● Damping Factor	40	40
● Channel Separation	〉65 dB	〉65 dB
Generals		
● Operating Voltage (Negative Ground)	12V DC	12V DC
● Speaker Impedance (Minimum)	2 ohms	2 ohms
● Fuse	30A	25 X 2A
● Dimensions(Inches)		
● Width	13 3/8	14 1/8
● Height	2 3/8	2 3/8
● Depth	117/8	11

INKEL Europe GmbH, D-65824 Schwalbach

Note : Specifications & design subject to change without notice for improvement.

Above declaration has to be filled out and signed by the manufacturer or the authorized representative and has to be attached to the documents of the device.

Attention :

The Declaration of Conformity only can be issued by the manufacturer or his authorized company located in the EEC

DECLARATION OF CONFORMITY

We INKEL EUROPE GMBH
(Name of the offerer)
AM KRONBERGER HANG 3, 65824, SCHWALBACH, GERMANY.
(Address)

explain in own responsibility, that the product :

Kind of equipment : CAR BOOSTER

Type- designation : XA5300 XA5400

is in compliance with following norm(s) or documents :

EN 55020 : 1988

Accredited testlaboratory :
MIKES PRODUCT SERVICE GmbH
Ohmstraße 2-4
94342 Strasskirchen

June, 1995
place and date of issue

SALES DEPT.
Manufacturer / Authorized representative
name and signature